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ABSTRACT

This study analyzed the discourse of electronic mail (e-mail) exchanges between students of English as a second language (ESL) and other ESL learners from other cultures and at varying proficiency levels (keypals), focusing on what these exchanges may reveal about learners' progress through the "Zone of Proximal Development," a Vygotskian concept denoting the gap between what the learner can accomplish alone and what he can accomplish in cooperation with others who are more skilled or experienced. Subjects were approximately 150 intermediate ESL students at the University of Puerto Rico who use the computer laboratory once a week and regularly send and receive e-mail messages to/from each other or keypals in other countries. A variety of discourse modes were examined: expository; descriptive; narrative; and argumentative. Students were also surveyed concerning their perceptions of ESL learning through the experience. It was found that students were highly motivated to use e-mail for communication, and used peer tutoring and collaboration in composing outgoing messages and studying incoming ones. General chat sessions not focused on a particular topic appeared less productive for ESL learning. Excerpts from the student questionnaire are appended. (Contains 12 references.) (MSE)

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Email Keypals in Zone of Proximal Development

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Good afternoon. My name is Lionel Kaufman and I teach English at the University of Puerto Rico, Humacao campus. Occasionally, I'm inclined to say that my name is "lionelkaufman dot edu" because it seems that most of my communication in the past few years is through email or the Internet. And, I'm afraid to admit, that I'm imposing this hi-tech life-style on my ESL students in Puerto Rico, whether they like it or not.

For me to present a paper at a prestigious international convention such as this is an intellectual challenge. Many of you in the audience are language scholars and researchers, many with considerable experience in using email and online instruction. In addition, by attending this convention I can partake in the mutual sharing of ideas and techniques. As we all know, one of the advantages of attending a professional conference is intellectual growth. By conversing and discussing issues of mutual interest we can solve problems and arrive at new conceptualizations that would not be possible if we were to read and study independently. ESL students who write email message to a keypals from a foreign culture are in a similar position. By studying and working alone their language development is circumscribed, but by conversing with other, more proficient and skilled peers, they can develop their language skills at a more rapid pace. By communicating with more proficient peers they will summon all the linguistic and socio-cultural knowledge at their disposal in order to make themselves understood and their learning will accelerate.

This, in a nutshell, was the theoretical framework for my research project. Email exchange with more skilled keypals from different cultures is a kind of collaborative learning that allows the learner in communication with a more skilled peer to advance through what Vygotsky calls his or her "Zone of Proximal Development," The ZPD is "the gap between what the learner could accomplish alone and what he or she could accomplish in cooperation with others who are more skilled or experienced" (Warschauer, 1997).

The questions I pose in this paper are basically two: The first is on the level of perception. I want to know whether the student who communicates with an email keypal feels that he is engaging in meaningful communication and is profiting from the experience; in other words, whether he *feels* he is learning. The second explores the reality of the learning situation from the point of view of the educator. By doing a discourse analysis of the learner's online writing, I wanted to explore whether the learner was really being challenged to use his full linguistic

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potential, and if not, under what circumstances would he be so challenged. My conclusions, as you will soon see, is that not all email communication is profitable from the learning perspective, and there is a lot that the teacher can do to orchestrate the online tasks so that students are using their time more efficiently.

Two main interpretations have arisen from how learners traverse through the ZPD. In one interpretation, the teacher models an approach to the learning; in another, advanced by Wells (1992), the text serves as a thinking device to allow learners to collaboratively generate new meanings. Here the teacher "assists, not as a model but rather as a guide while students collaborate to make connections between new ideas...and prior knowledge" (Warschauer, p. 471).

According to this model, a learner traversing the ZPD begins as object-regulated since he is still dominated by the objects in the environment, meaning the text. However, once he begins to collaborate with adults or more skilled peers, he becomes "other regulated" as he is "led through dialog, with a strategic assistant, towards completion of a task" (p. 484). Other regulation, however, is just a transitory stage towards the ultimate goal of "self-regulation" which is the capacity for independent problem-solving. In this project, the written text is in the form of an email to be sent to a more proficient peer. It serves as a vehicle for reflection that allows the learner "to bootstrap his or her thinking in a more powerful manner than is normally possible in speech" (Wells and Chang as cited in Warschauer, 1997).

My subjects are approximately 150 intermediate-level ESL learners who are assigned the task of communicating through email with each other and with ESL learners from other cultures and from various levels of L2 proficiency. Based on a Vygotskian theoretical framework, my hypotheses are that learners will perceive having learned more through communication with peers at a more advanced level of proficiency than with peers at their own level or a lower level. I think they will also perceive a greater benefit in communicating with peers in another culture. In addition, I have attempted to do a discourse analysis to explore the benefits of interaction with a keypal from one's own culture as well as from another culture, and I wanted to observe whether the discourse from a keypal at the same level of proficiency was qualitatively different from that of a keypal at a higher level of proficiency.

Let me tell you a little more about my subjects. There are approximately 150 students who are taking a required course called Basic English at the University of Puerto Rico, Humacao campus. They are at what we call the intermediate level of proficiency since we have three different levels--Pre-Basic, Basic, and English for English majors. The students take computer lab once a week and they regularly send and receive email messages either to each other or to keypals in other countries through Dave's Email Connection (the address of this

webpage is in the bibliography). Dave's Email Connection provides what it calls a guestbook list of some 50 to 100 email messages from ESL learners who want email keypals. The messages are usually capsule personal introductions where they tell about themselves and express a desire to communicate with other ESL learners. Communication in this webpage is what we call non-synchronous electronic communication since the response to a message is delayed, as opposed to synchronous communication done in real time. Most of the time students were free to choose their keypals, to choose the topics they wished to discuss, and to send and receive messages during the lab time and also during their free time. They were given credit towards their grades based on the number of messages they sent and received. However, in order to receive credit for their work they had to send me a copy of these messages.

So, basically I studied communication between the students and two different populations: Either the students communicated with each other or with learners from outside the college. Therefore, the time delay in communication was inherently different since the time lapse between posting a message and receiving a response was usually longer if messages were sent on the Internet. Thus, the communication through Dave's Email Connection was undoubtedly less immediate since the posting, reading, and responding to messages was sometimes separated by hours or days. On the other hand, in the communication with their classmates, they had less time to compose their messages. The advantages of non-synchronous communication, as Warschauer has pointed out, is that it makes possible "reflection and analysis in direct interpersonal communication." On the other hand, the urgency of the communicative flow in the synchronous variety "demands that students pay less attention to the formal accuracy of their writing."

The second part of my research was to study evidence of learning through analyzing the quality of the discourse. As you will soon see, I found that much of the discourse to foreign keypals involved formal introductions, a kind of specialized form of expository writing; that is, it involved introducing yourself and telling about your interests and everyday activities. However, in order to encourage students to go beyond this mode, I urged them to focus on suggested topics. For example, in one task I encouraged students to use an argumentative mode of discourse. In this activity students entered a "list-serv" file so that they could send messages to the entire class and they expressed their opinions about my technique of giving students points for participating in class discussions. In another task, I urged them to tell their foreign keypals about an eclipse of the moon that Puerto Rico was recently a witness to. In this way, I was able to analyze a variety of discourse modes and to place the samples in the traditional discourse categories. These are: *expository*, which, in this case involved personal introductions; *descriptive*, or describing one's living

arrangements; *narrative*, telling stories about themselves or others; and *argumentative*, focusing on specific issues. These categories were later collapsed into three: *expository*, *argumentative*, and *narrative-descriptive* due to the fact that I received so few samples of descriptive writing.

The first part of data analysis involved analyzing students' perceptions of their own learning through email communication. I was able to support my hypothesis that students perceive a greater benefit in conversing with more proficient keypals. I asked students to fill out a questionnaire on communication with different keypals, which included their own classmates as well as foreign keypals in Dave's Email Connection (see Appendix). I asked them first to assess their own language proficiency and to compare it with the proficiency of the last two keypals they communicated with. Then, in Question 8, I asked them to choose which of these keypals they had more communication with and explain why. In Question 9 I asked them to choose which they learned more English from, in Question 10, which they intended to communicate with in the future, and in Question 11, which keypal they found to be more interesting.

As you can see in Table 1, the first pairwise assessment from Question 8 supports the hypothesis that students were more favorable to more skillful keypals. When asked to rate the communication with more proficient keypals, 55 percent received a positive rating as opposed to a 40 percent positive rating for the less proficient group.

A similar pattern developed in the other three questions. In Question 9 (Table 2) they were asked to rate how much they learned from keypals of different skill levels. Here 53 percent said they learned from the high proficiency group while only 40 percent said they learned from the low proficiency group. In Question 10 (Table 3), students were asked which of the pair they would most likely communicate with in the future. Here, 72 percent said they would write the high proficient keypals while there was no clear direction in the rating of lower proficiency subjects. In Question 11 (Table 4), students were asked which keypals were interesting. Respondents chose 58 percent of the high proficient keypals and only 38 percent of the low proficient ones.

Table 1

With which keypal did you have more communication?

	More Comm.	Less Comm.	Totals
High Proficient Keypal	60 (55%)	50 (45%)	110 (100%)
Low Proficient Keypal	14 (40%)	21 (60%)	35 (100%)
Totals	74 (51%)	71 (49%)	145 (100%)

Table 2

With which keypal did you learn more English?

	Learned More	Learned Less	Totals
High Proficient Keypal	60 (53%)	53 (47%)	113 (100%)
Low Proficient Keypal	12 (40%)	18 (60%)	30 (100%)
Totals	72 (50%)	71 (50%)	143 (100%)

Table 3

With which keypal will you communicate in the future?

	Commun.More	Commun.Less	Totals
High Proficient	72 (71%)	29 (29%)	101 (100%)
Low Proficient	18 (51%)	17 (49%)	35 (100%)
Totals	90 (66%)	46 (34%)	136 (100%)

Table 4

Which keypals were more interesting?

	More Int.	Less Int.	Totals
High Proficient	56 (58%)	41 (42%)	97 (100%)
Low Proficient	13 (38%)	21 (62%)	34 (100%)
Totals	69 (53%)	62 (47%)	131 (100%)

In the discourse analysis, I attempted to demonstrate that the email discourse of students with high proficiency keypals was qualitatively different from that of low proficiency ones and, in addition, that the discourse was qualitatively different across different modes of discourse. Here I compared communication with high proficiency keypals from Dave's Email Connection with communication with the students' messages to their own classmates, all of whom who were at the same level of proficiency. Messages were compared on a pairwise basis; that is, a student's message to a classmate was compared to the same student's message to a foreign keypal. The messages were analyzed using t-unit analysis and an analysis of dependent clause structure which involved taking the ratio of coordinate to subordinate clauses, which is a slightly modified version of a technique used by Warschauer (1997).

Two kinds of t-unit analysis were used; first, mean t-unit length was computed to compare the two sets of samples. A t-unit is defined "an independent clause plus any subordinate clauses embedded in it" (Dvorak, 1987). Thus, a sentence "My name is Juan" is counted as one t-unit, as is the sentence "I live in San Juan, which is the capital city of Puerto Rico" since the sentence contains an independent clause plus a dependent subordinate clause. However, the sentence "My name is Juan and I live in San Juan" counts as two t-units since both parts of a coordinate sentence are independent clauses. Mean t-unit length is said to increase with language proficiency since more proficient learners use more subordination while less proficient ones use more coordination. Since much of the discourse of second language learners is marred by errors, I also opted to include an alternate measure adopted by some researchers of using error-free t-units.

Using these four measures, the data failed to support the hypothesis that students' writing to more proficient keypals on Dave's Email Connection featured a more complex lexical and syntactic structure than their writing to their classmates; in fact, the evidence points in the opposite direction. Table 5 shows that the discourse of students' emails to each other features a higher number of mean t-units than the discourse of their email messages to more proficient keypals through Dave's Email Connection. When I used error-free t-units as my measure, the evidence was the same (Table 6). .

Table 5

Mean length of T-Units in Discourse Samples
From High and Low Proficiency Keypals

	# of Cases	Mean	SD	Stan. Error
Low Prof. (Classmates)	23	81.7	52.9	11.0
High Prof. (Foreign)	16	67.6	13.9	3.5

t value=1.22 p<.23

Table 6

Mean Length of Error-Free T-Units in Discourse Samples
From High and Low Proficiency Keypals

	# of Cases	Mean	SD	Stan. Error
Low Prof. (Classmates)	23	81.7	71.5	14.9
High Prof. (Foreign)	16	63.7	18.2	4.6

t value=1.15 p<.26

Why did the study fail to show any significant differences here? A careful examination of students' email messages to their classmates and their foreign counterparts illustrates that the formality of most initial email encounters discourages creative, free-flowing interaction and this formality is even more accentuated in an initial encounter with an unknown keypal. When students introduce themselves they tend to use short, choppy, formulaic statements characteristic of this kind of expository writing. A somewhat illustration of this was brought out by Carlos, one of my male students who tends to come on strong to just about every female he encounters whether in cyberspace or in real life. When corresponding to a Chinese girl from Hong Kong for the first time, Carlos writes:

Well, let me present myself. I'm a 18-year old man. I'm study in the Puerto Rico University in Humacao. I'm studying Business Administration. I like the love, the poetry, music, theater, and being an actor. I like the world; is very fun. I like to go to movies, to the beach at moonlight and pass a great time. Well, hope to receive an answer. Love, Carlos.

To a classmate that Carlos has known for some time, Carlos writes:

Hello, Brendly. I hope that you're fine. I want to tell you that your friendship is very important to me and thank you for give me a beautiful smile every day. I.pray all night, and one of the things that I pray is for you want that you can get all that you want. You know that you can count with me all time, and no matter how, I'll be there for you. Since I meet you last year, I found in you a creative, good, and lovely girl in you. And since that time, I'm happy because I know that I had found good people and one of them is you. I hope that our friendship grow so big that a tree and so beautiful like a rose. You can count with me. Love, Carlos.

Carlos's somewhat more restrained introduction to the Chinese girl featured a mean t-unit length of 7, but in his no holds barred overture to a girl in his class, the mean t-unit length soared to 14.3. The latter also contained 11 instances of subordination versus three coordinations versus only three subordinations over zero coordinations for the message to the Chinese girl.

Further analysis of samples from other modes of discourse supported the notion that it was the *discourse genre*, rather than the level of proficiency, that determined the syntactic complexity of the email messages. And a search of the research literature of written discourse seems to support this finding.

Numerous studies (Crowhurst and Piche, 1979; Perron, 1976; Rosen, 1969; San Jose, 1972) have demonstrated that mean length of t-unit varies depending on the mode of discourse. It tends to be greater for argumentation than for description, with exposition and narration falling somewhere in between.

My data show that once students get beyond the introduction mode and write narrative, descriptive, and argumentative passages, the lexical and syntactic complexity increases significantly. In Figures 1, 2, and 3 you can see another student, Rafa, who wrote three different keypals in three different modes of discourse. In the first (Figure 1), he is writing a classmate whom he has some acquaintance with, but his message is still a kind of introduction, which is labeled *exposition*. As a result, the length is only 4.9 words per t-unit. In Figure 2, he is introducing himself to a foreign keypal and it is a little more descriptive in nature. Thus, it was placed in the *narrative-descriptive* category. Also, the length is a little higher, 6.2 words per T-unit In Figure 3, he is commenting on my system of awarding points for class participating and he is arguing in favor of the system. For this type of *argumentative* discourse, the length is 9.8 words per T-unit. Notice the numerous subordinate clauses in this sample versus the use of coordinate clauses in the other samples.

Figure 1
Expository Discourse

Hi. I am Amuary.* You can call me Rafa if you want.* This is my fourth time that I wrote you.* I study chemistry.* I live in Caguas* and I want to meet you.* You are friendly.* I speak with you* and you inspire trust.* I hate Humacao.* I want to transfer to Mayaguez.* I was there last semester* and I like it so much.* I am 10 years old* and my birthday will be in May 20.* I don't have girl friend.* Do you?

(17 T-Units-4.9 Words Per T-Unit)

Figure 2
Narrative-Descriptive Discourse

I want to be your friend.* I study industrial Chemistry in the University of Puerto Rico (UPR), Humacao campus.* I like to run roller blades skates, going to the beach, seeing television, and hearing Spanish rock.* I like concerts a lot.* Do you now Ricky Martin?* Do you have a boy friend?* What do you study?* Please tell me something from you.* At this moment I'm alone.* I don't have a girl friend.* Write me back.* Bye.

(11 T-Units-6.2 Words per T-Unit)

Figure 3
Argumentative Discourse

I like Mr.Kaufman *puntitos* system because I can practice in the class.* That show him my interest in the class.* It is better than the tests.* Do you think like me?* The *puntitos* pressure us to study.* In the quizzes we only have to read over the material,* and we should have good punctuation.* Of course, if you read the lectures and if you answer the professor questions, it is a good idea.* If you do not think like me, please write me back* and expose your opinion.*

(10 T-Units-8.8 Words Per T-Unit)

In comparing mean T-unit length for all the samples, it is clear that students use more complex syntactic structure in certain discourse genres. The analyses are shown in Tables 6 and 7. Tables 7 and 8 show the results of a one-way analysis of variance comparing T-unit length among the three discourse categories. A post-hoc Scheffe test shows that argumentative discourse had significantly greater t-unit length than did expository discourse. In Table 9 and 10, the difference between the argumentative and the other two genres was even more dramatic with error-free T-units, with the difference between argumentative and expository being statistically significant. Finally, the ratio of coordination to subordination also varied depending on the discourse genre. As you can see in Table 11,

66.7 percent of the clause structure in expository discourse was coordination versus only 33.3 percent for subordination. In the other two genres the ratio was in the other direction with more subordination than coordination.

Table 7

One Way ANOVA of Mean Length of T-Units
For Discourse Samples
in Three Modes of Discourse

Source	DF	Sum of Sq	Mean Sq	F Ratio	F Prob
Between G	2	11637.124	5818.562	3.8237	.0312
Within G	36	54781	1521.718		
Total	38	66418.97			

Table 8

Post-Hoc Scheffe Test
For Mean Length of T-Units
in Three Modes of Discourse

		G 1	G 2	G 3
Mean	Group			
62.6316	G 1 (Expository)			
77.0000	G 2 (Desc-Narrative)			
110.2857	G 3 (Argumentative)	*		

Table 9

One Way ANOVA of Mean Length of Error-Free T-Units
For Discourse Samples
in Three Modes of Discourse

Source	DF	Sum of Sq	Mean Sq	F Ratio	F Prob
Between G	2	26347.01	13173.50	5.0337	.0118
Within G	36	94213 64	2617.04		
Total	38	120560			

Table 10

Post-Hoc Scheffe Test
of Mean Length of Error-Free T-Units
in Three Modes of Discourse

		G 1	G 2	G 3
Mean	Group			
56.8421 70.8462 128.2857	G 1 (Expository) G 2 (Des.-Narrative) G 3 (Argumentative)	 *		

Table 11

Ratio of Coordinated to Subordinated Clauses
For Discourse Samples in Three Modes of Discourse

	Expository	Narrative-Descriptive	Argument	Totals
Coordinate	52 (66.7%)	30 (40.0%)	15 (34.0%)	97 (49.2%)
Subordinate	26 (33.3%)	45 (60.0%)	29 (66.0%)	100 (50.8%)
Totals	78 (100%)	75 (100%)	44 (100%)	197 (100%)

The implications of this study for those of us who use email communication to teach English as a Second Language are clear. Students are highly motivated to use this medium of communication because it is a meaningful way of engaging in communicative interaction with native speakers and non-native speakers alike. Without the urging of the teacher, students make use of peer tutoring and other collaborative methods in composing messages and in studying incoming ones. Nevertheless, giving students free rein to choose their keypals as well as the topics of discourse may result in making the writing less versatile. As ESL teachers, we must somehow steer a course between giving students too much freedom and restricting the scope of their writing so that it becomes another structured, teacher-centered activity.

Using email as a teaching device is one way we can get students to use authentic communication in a meaningful setting. However, once students have made their initial introductions, it may be advisable to steer them in other directions; for example, students can participate in discussion forums. Many websites featuring forums tailored to the ESL learner have recently been launched for cross-cultural discussions that allow students

considerable leeway in terms of freedom to pursue their individual areas of interest. My research seems to indicate that general chat sessions that are not focused on a particular topic should be avoided, and even class to class email exchanges tend to be limited to superficial dialogue. Engagements with keypals on the Internet is frequently temporary and even a keypal for whom you have had a sustained relationship can easily disappear into Cyberspace. The question is how we can best harness this new technology and use it so that learners are challenged to cross the "zone of proximal development?" Research in this area is just beginning.

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APPENDIX

Excerpts from Questionnaire

1-Sex M F

2-How proficient are you in English? (Circle one)

Know a lot Know a little

5 4 3 2 1

3-Write the name of the last person you wrote by "mail" _____

4-What Nationality was this person? _____

5-How proficient was this person in English? (Circle one)

Know a lot Know a little

5 4 3 2 1

6-Write the name of the person you wrote to before this one_____

7-How profocient was this person in English? (Circle one)

Know a lot Know a little

5 4 3 2 1

8-With which of these persons did you have more communication?

_____

9-With which of these two persons did you learn more English?

_____

10-Do you plan to write these persons in the future? Which one?

_____

11-With which of these persons did you have a more interesting discussion?

_____

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